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Journal of the Society of Arts.

FRIDAY, JULY 17, 1868.

Announcements by the Council.

HARVESTING CORN IN WET WEATHER.

The Essay by Mr. W. A. Gibbs, of Gillwell-park, Sewardstone, Essex, for which the Gold Medal of the Society and a prize of Fifty Guineas were awarded, will shortly be published by Messrs. Bell and Daldy, York-street, Covent-garden, publishers to the Society of Arts; price one shilling, illustrated by woodcuts.

In addition to the Essay to which the above prize was awarded, the Judges desire specially to commend the Essay by Mr. Gilbert Murray, Elvaston Castle, Derby.

The Judges also commend the Essays by Messrs. George Strickland, Low Abbey, Kirkley, Thore, Penrith; David Robinson, Burntshields, Kilbarchan, Paisley; William Churchman, Lydling Farm, Godalming; E. J. Cumming, Linscott, Moreton Hampstead, Devon; and Thomas Ferguson, Kinochtry, Cupar Angus, N.B.

SUBSCRIPTIONS.

The Midsummer subscriptions are due, and should be forwarded by cheque or Post-office order, crossed "Coutts and Co.," and made payable to Mr. Samuel Thomas Davenport, Financial Officer.

Proceedings of the Society.

CANTOR LECTURES.

"ON FOOD." By DR. LETHBY, M.A., M.B., &c.

LECTURE I., DELIVERED MONDAY, JANUARY 27.

Varieties of Food—their Chemical Composition and Nutritive Value.

The economy of food, in its fullest signification, is a matter of national importance; for the political influence of a nation is as much dependent upon the muscular strength of the people as upon their intelligence and commercial industry; and this strength is wholly referable to a right use and proper distribution of food.

We perceive this not merely in the calamities of actual want, as in the fevers of famine, but also in the less prominent, but equally significant decline of health in times of partial distress, when the vigor and energy of the poorer part of the population are so reduced as to lay them open to disease. In fact, the experience of our public hospitals too often elicits the fact that the wasted power of the patient has been the advent of incurable disease. Nor is this all; for, as Mr. Simon observes—"Long before insufficiency of diet is a matter of hygienic concern; long before the physiologist would think of counting the grains of nitrogen and carbon which intervene between life and starvation, the household will have been utterly destitute of material comfort; clothing and fuel will have been scantier than food; against inclemencies of weather there will have been no adequate protection;

dwelling-space will have been stinted to the degree in which over-crowding produces or increases disease; the home will be where shelter can be cheapest bought, where sanitary appliances are least considered, and where cleanliness is almost impossible." And all this distress falls heaviest upon those who are least able to bear it—the mother and her children; for the father, to be able to work, even lightly, must eat, and thus the others are the largest sufferers. Bad, however, as the immediate consequences are, they are nothing in comparison to the remote—the sickly race that comes of want.

In examining, therefore, this question of the economy of food, we must not only look at the nutritive value of different articles of diet, but we must also consider how food can be best distributed and utilized.

To-day we will investigate the principal varieties of food, and ascertain their peculiar qualities and dietetical values. For this purpose it will be necessary to have some standard for comparison, but this is avowedly a difficult matter; for if we compare foods according to the proportions of their principal constituents—viz., albuminous matters, starch, saccharine, and saline—we shall find that the relative quantities vary to such a degree as to make the comparison almost useless; and if we fix our attention on one of these constituents—the nitrogenous, for example—and make it the exponent of nutritive value, we get into the difficulty of either overloading the equivalent with a large amount of carbonaceous material, or of having it deficient therein. If, for instance, we desire to know the quantities of different foods which would furnish the 1,200 grains of nitrogenous matter required by a man in his daily diet, we should find that the following are the proportions:—

TABLE I.

Proportions of Different Foods Required to Yield 1,200 Grains of Nitrogenous Matter.

	Grains.	Pounds.
Skim-cheese	2,681 ..	0.4
Lean meat	6,217 ..	0.9
White fish	6,630 ..	1.0
Fat meat	9,231 ..	1.3
Fat bacon	13,636 ..	2.0
Bread	14,815 ..	2.1
Rice	19,048 ..	2.7
New-milk	29,268 ..	4.2
Potatoes	57,143 ..	8.2
Parsnips or turnips	100,000 ..	14.3
Beer or porter	1,200,000 ..	171.4

In this manner tables have been constructed of the nutritive values of food, and I show you one of them.

TABLE II.

Nutritive equivalents—calculated according to the amounts of Nitrogen in the Dry Substances; Human Milk being 100:—

VEGETABLE.			
Rice	81	Oats	138
Potatoes	84	White bread ..	142
Maize	100	Black bread ..	166
Rye	106	Peas	239
Radish	106	Lentils	276
Wheat	119	Haricots	283
Barley	125	Beans	320
ANIMAL.			
Human milk ..	100	Lamb	833
Cow's milk ..	237	White of egg ..	845
Yoke of egg ..	305	Lobster	859
Oysters	305	Skate	859
Cheese	331	Veal	873
Eel	434	Beef	880
Mussel	528	Pork	893
Ox-liver	570	Turbot	898
Pigeon	756	Ham	910
Mutton	773	Herring	914
Salmon	776		

I hardly need say that comparisons of this description are of little practical value, for they furnish no indication of the digestive labour required to utilize the products; besides which we are far from being assured, at the present time, that the nitrogenous elements of our foods are the most important.

In framing, therefore, a table of alimentary equivalents, regard must be paid to all the constituents. This I have endeavoured to express in Table No. 3, wherein

I have shown the per cent. of nitrogenous and carbonaceous matter, and the proportions of the latter to one of the former; but here again the actual value of the several carbonaceous compounds is very different; for, although the fattening and respiratory powers of starch, gum, sugar, and pectin, may be nearly the same, yet the power of fat is about 2.5 times as great as that of sugar; and this must be considered, irrespective of other functions of fat, in estimating the value of carbonaceous food.

TABLE III.—NUTRITIVE VALUES OF FOOD.

	WATER.	ALBUMEN, &c.	STARCH, &c.	SUGAR.	FAT.	SALTS.	TOTAL PER CENT.		Carbonaceous to one Nitrogenous.
							Nitrogenous.	Carbonaceous.	
Bread	37	8.1	47.4	3.6	1.6	2.3	8.1	52.6	6.5
Wheat flour	15	10.8	66.3	4.2	2.0	1.7	10.8	72.5	6.7
Barley meal	15	6.3	69.4	4.9	2.4	2.0	6.3	76.7	12.2
Oatmeal	15	12.6	58.4	5.4	5.6	3.0	12.6	69.4	5.5
Rye meal	15	8.0	69.5	3.7	2.0	1.8	8.0	75.2	9.4
Indian meal	14	11.1	64.7	0.4	8.1	1.7	11.1	73.2	6.6
Rice	13	6.3	79.1	0.4	0.7	0.5	6.3	80.2	12.7
Peas	15	23.0	55.4	2.0	2.1	2.5	23.0	59.0	2.5
Arrowroot	18	..	82.0	..	..	..	..	82.0	..
Potatoes	75	2.1	18.8	3.2	0.2	0.7	2.1	22.2	10.6
Carrots	83	1.3	8.4	6.1	0.2	1.0	1.3	14.7	11.3
Parsnips	82	1.1	9.6	5.8	0.5	1.0	1.1	15.9	14.5
Turnips	91	1.2	5.1	2.1	..	0.6	1.2	7.2	6.0
Sugar	5	..	..	95.0	..	..	..	95.0	..
Treacle	23	..	..	77.0	..	..	..	77.0	..
Now milk	86	4.1	..	5.2	3.9	0.8	4.1	9.1	2.2
Cream	66	2.7	..	2.8	26.7	1.8	2.7	29.5	10.9
Skim milk	88	4.0	..	5.4	1.8	0.8	4.0	7.2	1.8
Buttermilk	88	4.1	..	6.4	0.7	0.8	4.1	7.1	1.7
Cheddar cheese	36	28.4	..	..	31.1	4.5	28.4	31.1	1.1
Skim do.	44	44.8	..	..	6.3	4.9	44.8	6.3	0.1
Lean beef	72	19.3	..	..	3.6	5.1	19.3	3.6	0.2
Fat do.	51	14.8	..	..	29.8	4.4	14.8	29.8	2.0
Lean mutton	72	18.3	..	..	4.9	4.8	18.3	4.9	0.3
Fat do.	53	12.4	..	..	31.1	3.5	12.4	31.1	2.5
Veal	63	16.5	..	..	15.8	4.7	16.5	15.8	1.0
Fat Pork	39	9.8	..	..	48.9	2.3	9.8	48.9	5.0
Green bacon	24	7.1	..	..	66.8	2.2	7.1	66.8	9.4
Dried do.	15	8.8	..	..	73.3	2.9	8.8	73.3	8.3
Ox liver	74	18.9	..	..	4.1	3.0	18.9	4.1	0.2
Tripe	68	13.2	..	..	16.4	2.4	13.2	16.4	1.3
Poultry	74	21.0	..	..	3.8	1.2	21.0	3.8	0.2
White fish	78	18.1	..	..	2.9	1.0	18.1	2.9	0.2
Eels	75	9.9	..	..	13.8	1.3	9.9	13.8	1.4
Salmon	77	16.1	..	..	5.5	1.4	16.1	5.5	0.3
Entire egg	74	14.0	..	..	10.5	1.5	14.0	10.5	0.7
White of do.	78	20.4	..	..	..	1.6	20.4	..	..
Yolk of ditto.	52	16.0	..	..	30.7	1.3	16.0	30.7	1.9
Butter and fats	15	..	..	..	83.0	2.0	..	83.0	..
Beer and porter	91	0.1	..	8.7	..	0.2	0.1	8.7	87.0

Another method of determining the values of food, is by estimating the proportions of nitrogen and carbon in them, and comparing them with the proportions required in a standard diet.

Judging from the minimum quantities of food which an ordinary individual is capable of existing on, without suffering in health, it would seem that about 4,100 grains of carbon, and 190 grains of nitrogen are required in his daily diet. These proportions have been determined from a large number of observations, as by those of Dr. Lyon Playfair, in his inquiries into the dietaries of hospitals, prisons, and workhouses, and by those of Dr. Edward Smith, in his examination of the amounts of food which the Lancashire operatives were capable of living on during the cotton famine, and also by his inquiries into the dietaries of in-door labourers. The

proportions which Dr. Smith gives as a famine or barely sustaining diet, are the following:—

	Carbon (grains).	Nitrogen (grains).
Adult woman	3,900	.. 180
Adult man	4,300	.. 200
Average adult	4,100	.. 190

These proportions are contained in 2lbs., and in 2lbs., 3oz. of bread; and they closely accord with another set of facts, derived from an examination of the amounts of carbon and nitrogen exhaled and secreted from the body during health and idleness.

Taking these numbers, therefore, as the exponents of the nutritive values of food, we are able to construct the following table:—

TABLE IV.—NUTRITIVE VALUES OF FOOD.

	GRAINS PER POUND.		VALUE PER POUND	GRAINS FOR ONE PENNY.		WEEKLY COST OF FAMINE DIET FOR	
	Carbon.	Nitrogen.		Carbon.	Nitrogen.	Carbon.	Nitrogen.
Split peas	2730	255	d.	2730	255	d.	d.
Indian meal	2800	123	1	2800	123	10·5	5·2
Barley meal.....	2730	70	1	2730	70	10·5	19·0
Rye meal	2660	88	1½	2128	70	13·5	19·0
Seconds flour	2660	120	1½	1773	80	16·2	16·6
Oatmeal	2800	140	2	1400	70	20·4	19·0
Bakers' bread	1995	90	1½	1330	60	21·6	22·1
Pearl barley	2660	91	2	1330	45	21·6	29·5
Rice	2730	70	2	1365	35	20·5	38·0
Potatoes	770	24	0½	1540	48	18·6	27·7
Turnips	238	13	0½	476	26	60·3	51·1
Green vegetables	420	14	0½	840	24	34·1	55·4
Carrots	385	14	1	385	14	74·8	95·0
Parsnips	421	12	1	421	12	66·4	110·8
Sugar	2800	..	5	560	..	51·2	..
Treacle	2200	..	1	2200	..	13·0	..
Buttermilk	335	35	0½	670	70	42·8	19·0
Whey	154	13	0½	628	52	45·8	25·6
Skimmed milk.....	350	34	1	350	34	82·2	39·1
New milk.....	378	35	2	189	18	154·0	73·9
Skim cheese	2348	364	3	783	121	36·6	11·0
Cheddar do.....	2520	315	8	315	39	91·1	34·1
Bullocks' liver	1226	210	3	408	70	70·3	19·0
Mutton	2902	140	5	580	28	49·5	47·5
Beef	2301	175	8	288	22	99·6	60·5
Fresh pork	2950	108	7	421	15	68·1	88·7
Dry bacon	4270	98	9	474	11	60·5	120·9
Green do.	3990	79	8	492	10	58·3	133·0
White fish	900	130	2	450	65	63·8	20·4
Red herrings	1435	217	4	359	54	80·0	24·6
Dripping	5320	..	6	887	..	32·3	..
Suet	4710	..	7	673	..	42·6	..
Lard	4819	..	9	535	..	53·6	..
Salt butter	4585	..	12	382	..	75·1	..
Fresh do.	4712	..	16	294	..	97·6	..
Cocoa	3934	140	4	983	35	29·2	38·0
Beer and porter	315	1	1	315	1	91·1	1330·0

And now we may proceed to examine in detail the general properties, and the nutritive qualities of different foods.

Primarily all our foods are derived from the vegetable kingdom, for no animal has the physiological power of associating mineral elements, and forming them into food. What we may yet do by means of chemical agencies in the laboratory is another question; but within our own bodies there is no faculty for such conversion. As I shall hereafter explain to you, our functions are of an opposite kind. We are destructive creatures, not constructive. It is our province to pull down what the vegetable has built up; to let loose the affinities which the plant has brought into bondage, and to restore to inanimate nature the matter and cosmolical force which the growing plant had taken from her.

Foremost, therefore, of our foods are those which come at once from the vegetable kingdom; and of these the *cereals* are the most important, as wheat, barley, oats, rye, maize, or Indian corn, rice, millet or durra, and Guinea corn.

Wheat.—Different species of this grain are cultivated, but the most common in this country is *Triticum vulgare*, of which there is a summer and winter variety.

The grain varies a good deal in composition according to season, climate, and soil; but, as a rule, the wheat of southern climates, and warm seasons, is richer in gluten, and of harder texture than that of colder times. They are then called stronger grains, although the

latter, from their being softer and kinder, give a larger proportion of flour. Some of the hardest varieties of wheat, as *rivets*, are used to strengthen the flour of new grain, which is always unmanageable, and to improve that of bad seasons and of damaged quality.

The structure of the grain is like that of all the cereals; there is an outer siliceous and woody covering, which is altogether valueless as food; then there is a layer of rich nitrogenous matter, containing a digestive body called *cerealine*, and within that is the flour, which forms the great bulk of the seed.

When ground whole, it forms *brown meal*, which is rarely used in England at the present time, although it was the common food of our forefathers, and even now is much employed in Westphalia, to make the dark-coloured bread called *pumper-nickel*. It contains from 5 to 12 per cent. of indigestible matter, in the form of bran, the removal of which, according to Liebig, is only a refinement of luxury.

The practice at the present time is to bolt or sift the ground meal through sieves, or silks, of different degrees of fineness, and thus to remove the coarser bran. The products have different names in different places, and have also different values; but generally a hundred pounds of wheat will yield from 78 to 80 parts of good serviceable flour. The other products are about 2 parts of *specks*, or *tails*, or *tippings*; from 2 to 3 parts of *sharps*; about 3 of *fine pollard*; from 3·5 to 6 of *coarse pollard*; and from 4 to 10 of *bran*. The relative wholesale values of these are about as follows:—

Vegetable Foods.	lbs. per bushel.	Price per bushel.	Price per 20 lbs.
		s. d.	s. d.
Fine flour	56	10 0	3 7
Seconds ditto	56	7 9	2 9
Sharps	26	2 0	1 6
Fine pollards	18	1 0	1 1
Coarse ditto	14	0 10	1 2
Bran	12	0 9	1 3

Seconds flour is practically the best for domestic use; and of this there should be at least 80 per cent. obtained from the grain. Attempts have often been made to increase the produce; for as the bran contains a good deal of nitrogenous matter, and is, moreover, rich in fat and saline substances, it has been thought wasteful to remove it; but the experimental researches of Poggiale, the learned professor at Val-de-Grace, have shown that at least 50 per cent. of the bran is perfectly indigestible, and may be passed successively through the bodies of four or five animals without undergoing change. It, moreover, acts as an irritant; and, by hurrying the food through the alimentary canal, is very likely to cause waste. Those who labour hard, as railway navigators, invariably choose the whitest bread for food, believing that it is not only more digestible, but it is stronger, and will enable them to do more work. Without doubt, however, there is room for improvement in the treatment of flour, and in the complete utilization of its several constituents. M. Mège Mouries has invented a process whereby the outer skin only of the wheat may be removed, and from 86 to 88 per cent. of flour realised. The process was examined in 1857, and reported very favourably of by Dumas, Pelouze, Payen, Peligot, and Chevreul, but I am not aware that it has come into use.

M. Mège Mouries also directed attention to the fact that the bran contains a portion of very soluble nitrogenous matter, *cerealine*, which is of the nature of diastase, and has the property of dissolving starch. This, no doubt, might be utilized by treating bran with warm water, and then using the water in the manufacture of bread.

The nutritive value of wheat is shown in Tables No. 3 and No. 4; and although the average amount of gluten is there set down at about 11 per cent., it ranges from 8 to 15 per cent.—the largest quantity being found in the wheaten flour of India, Egypt, South America, and the South of Europe.

It appears, too, that the quantity of gluten, as represented by nitrogen, increases with the coarseness of the flour, and so, also, does the amount of mineral matter.

TABLE V.

Percentage amounts of Nitrogen and Mineral Matter in the different Products of the Mill:—

	Nitrogen.	Mineral matter.
Fine flour	1.70 ..	0.71
Tails	1.86 ..	0.99
Fine sharps	2.21 ..	1.89
Coarse sharps	2.58 ..	3.80
Fine pollard	2.44 ..	5.50
Coarse pollard	2.42 ..	6.50
Bran.....	2.39 ..	7.00

Average in whole grain 1.82 .. 1.62

The starch and sugar amount to about 70.5 per cent. and the fat to 1.7; so that the carbonaceous is to the nitrogenous as 6.7 to 1, which is a good proportion. Other facts relating to its nutritive value are shown in Table No. 4.

The tests for a good flour are its sweetness and freedom from acidity or musty flavour; and its nutritive value, as far as gluten is concerned, is estimated by the process of Beccaria, who discovered gluten in wheat more than a century ago. A given weight of flour (say 500 grains) is

made into a stiff dough, and is carefully washed by tender manipulation under a small stream of water. The gluten remains, and when baked it expands into a clean-looking ball, which should weigh, when thoroughly dried, about 54 grains.

Of all the preparations of flour, *bread* is the most important. I shall hereafter describe the process of making it, but I may here remark that it should not contain more than from 36 to 38 per cent. of water, and the other constituents, excepting salt, should be the same as of good flour.

In practice, 100 lbs. of flour will make from 133 to 137 lbs. of bread, a good average being 134; so that a sack of flour of 286 lbs. should yield 95 four-pound loaves. The art of the baker, however, is to increase this quantity, and he does it by hardening the gluten through the agency of a little alum, or by means of a gummy mess of boiled rice, three or four pounds of which will, when boiled for two or three hours in as many gallons of water, make a sack of flour yield 100 four-pound loaves. But the bread is dropsical, and gets soft and sodden at the base where it stands. A good loaf should have the following characters:—

Kindness of structure—that is, not chaffy, or flaky, or crummy, or sodden; and

Sweetness to the palate and to the smell.

Wheaten bread is best eaten on the day after it is baked, for new bread is difficult of mastication, and still more difficult of digestion, because of its gummy nature. When it becomes stale it does not really get much dryer, but it undergoes a molecular change, which may be restored by heating the bread in a closed vessel to a temperature of 212°.

Wheaten bread is preferred to all other varieties of bread, because of its sweetness, and because it may be eaten alone. The nutritive constituents of it are in the same proportion as in wheat—namely, as 1 to 6.5, and a little more than two pounds of bread will supply the requirements of the system; although, as I shall hereafter explain, it cannot be used alone without loss of health and strength.

Barley-meal is the chief food of a large number of people in the North of Europe and in the South of England, where the labourer is partly paid his wages in meal or grain. It is also used in Wales and Scotland, especially in winter time, when wheaten bread is dear; and to some extent in Ireland. It is employed by about ninety per cent. of the outdoor labouring population of England. At the time of Charles I. (in 1626), according to M'Culloch, it was the usual food of the ordinary sort of people; and as late as the middle of the last century hardly any wheat was used in the northern counties of England. In Cumberland the principal families used only a small quantity about Christmas-time; and the crust of the everlasting goose-pie, which adorned the table of every country family, was invariably made of barley-meal.

The grain is almost always ground whole, and the farina has much resemblance to wheaten flour; but the amount of gluten is very different, in fact, the nitrogenous matter, which amounts to about six per cent., is chiefly in the form of albumen, hence, the bread is heavy and compact, for albumen will not vesiculate or sponge like gluten. The common way of making it into bread, is by mixing it with an equal proportion of wheaten flour; and sometimes it is mixed with oatmeal and rye-meal, and baked into cakes. But the best way of using it is in the form of thick gruel or stirabout, which is made by stirring the meal into boiling water.

Pearl Barley and *Scotch Barley* are the grain deprived of its husk, and rounded by attrition. The former is more carefully prepared than the latter, but both are used to give consistence to broth.

The nutritive value of barley meal is somewhat inferior to that of wheaten flour, but as the meal is cheaper than flour, it is more economical to use it: in fact, it is almost

the cheapest article of diet, as may be seen by reference to Table No. 4.

Oatmeal and rye-bread were once the chief diet of the servants of the wealthy, and even now the former is used by 90 per cent. of the agricultural labourers of England, and by a still larger proportion of the Scotch. The grain is very rich in gluten and fat, and it contains a good quantity of sugar and starch, the microscopic form of which is remarkable. The Scotch meal is always preferable to the English, on account of its higher nutritive power. It is prepared by grinding the kiln-dried grains, previously deprived of their skins. The Scotch grind it rather coarsely as compared with the practice in England.

Oatmeal is not nearly so white as wheaten flour, and its taste is peculiar, being at first sweet, then rough and bitter. Like barley-meal, it cannot be vesiculated into bread, but it makes good cakes, and these may be either leavened, as is the custom in Yorkshire, or unleavened, as in Scotland.

The common method of cooking it, however, is by stirring it into boiling water until it has the consistence of hasty pudding, and in this manner *porridge* is made; but if it be afterwards boiled for a short time it makes Scotch *brose*. In Ireland it is mixed with Indian meal, and then stirred into boiling water, thus making the mixture called *stirabout*.

The decorticated grain constitutes *grits* or *groats*, and when these are crushed or bruised they go by the name of *Emden groats*. The sole use of them is for making gruel, a drink that seems to have been a favourite with our forefathers; for in the *London Gazette*, for Friday, August 13, 1695, there is an advertisement to the effect that water-gruel was always ready at the Marine Coffee-house, in Birch-in-lane, Cornhill, every morning from six to eleven o'clock; and, it added, that as much as from four to five gallons of it were consumed there daily.

The husks of the grains are sold in Scotland under the name of *seeds*, and these, when steeped in water for a few days, until they become a little sour, like stale brewers' grains, and then squeezed out, produce a liquid which, when boiled down to the consistence of gruel, makes the food called *flummary* or *sowans* in Scotland, and *sucan* in South Wales. If it be boiled still more, until it becomes as thick as jelly, it forms *budrum*, or *bricchan*, as it is named in Wales. Oatmeal is, no doubt, rather hard of digestion, and causes irritation of the bowels. There is a notion also that it produces heat and irritation of the skin; and formerly, when sufficient care was not taken to remove the husk from the grain before it was ground, it was not an uncommon occurrence to find calculi or concretions of phosphate of lime, mixed with the silky bristles of the grain, in the alimentary canal. Somewhat similar concretions are found at the present time in the bowels of horses that feed too freely on bran or grains. The nutritive value of oatmeal is shown in Tables No. 3 and No. 4, and it will be noticed that although it is, weight for weight, more nutritive than wheaten flour, yet, considering its price, it is not so economical.

Rye meal is the chief food of northern nations, and was once a common article of diet with ourselves. It forms the dark-coloured and sour-tasting bread of the North of Europe. In this country it is rarely eaten alone, but is mixed with about twice its bulk of wheaten flour, forming what in many places is called *maslin*, and is then made into bread. The nutritive power of rye-meal is a little less than that of flour, and the proportion of the nitrogenous to the carbonaceous constituents is as 1 to 9·4.

(To be continued.)

MEMORIAL TABLETS OF GREAT MEN AND EVENTS.

In order to show how rich the metropolis is

in the memory of important personages and events, which it would be desirable to mark by means of tablets on houses, the Council have caused an alphabetical list to be prepared, the last part of which is now inserted. The Council request the assistance of members of the Society in completing and correcting this list, especially with reference to dates and the insertion of other names.

Whilst the Council intend proceeding with this work, they desire also to see it carried on by others—either by corporate bodies or individuals—and the Council will be happy to be instrumental in procuring suitable tablets from the manufacturers.

Talleyrand, Charles M. (b. 1754—d. 1838), Prince of Benevento; French diplomatist. Lived at Manchester-house, north side of Manchester-square, and often frequented the Travellers' Club, in Pall-mall.

Tarlton, Richard (d. 1588), actor and jester. Lived at (No.—?) Gracechurch-street. He kept an ordinary, called "The Castle," in Paternoster-row, near where Dolly's chop-house now stands. He lies buried at St. Leonard's, Shoreditch.

Taylor, John (b. 1580—d. 1654), poet; usually called the "Water Poet." He was a licensed sculler or waterman on the Thames. He lived and kept a tavern in Phoenix-alley, Long-acre.

Taylor, Joseph; one of the original performers in Shakespeare's plays. Lived, from 1634 to 1651, at (No.—?) Russell-street, Covent-garden.

Telford, Thomas (b. 1757—d. 1834); was the engineer of the Menai Bridge; also of St. Katherine's-docks. He lived and died at No. 24, Abingdon-street, Westminster. A portrait of him hangs at the Institution of Civil Engineers, of which society he was president for fourteen years.

Tempest, Pierce (d. 1717); artist and engraver of the "Cries of London." Lived over against Somerset-house, Strand. He lies buried at St. Paul's, Covent-garden.

Temple, Sir W. (b. 1628—d. 1698); statesman, political and miscellaneous writer. He lived on the south side of Pall-mall. He lies buried, and a monument is erected to his memory and that of his wife, in Westminster Abbey.

Tenison, Thomas (b. 1636—d. 1715); Archbishop of Canterbury; theological writer. He was the first rector of St. James's Church, Piccadilly. He much enlarged the Lambeth Library, and founded the library which bears his name in Castle-street, St. Martin's-lane. Lived in 1683 on the west side of St. Martin's-lane, and lies buried in St. Mary's, Lambeth.

Tenterden, C. Abbott, Lord (b. 1760—d. 1832); Lord Chief Justice. He lived at No. 28, Russell-square, where he died; and lies buried in the chapel of the Foundling Hospital.

Thackeray, W. M. (d. 1863), novelist, &c., was educated at the Charterhouse; lived at No. 36, Onslow-square; also in the red-brick house on the south end of the west side of Palace-gardens, which he built.

Theobald, Lewis (b. 1690—d. 1744); dramatic poet, critic, and editor of Shakespeare; the hero of the early editions of the "Dunciad." Lived in Wyan's-court, Great Russell-street, Bloomsbury. Buried in St. Pancras-in-the-Fields.

Thomas, Elizabeth (d. 1730), poetess, and known as "Corinna." She had much to do with the publication of Pope's private correspondence. She lived at (No.—?) Dyot-street, St. Giles's; also within the rules of the Fleet Prison. She lies buried in the Fleet-market ground, St. Bride's.

- Thomson, James (b. 1700—d. 1748), Pastoral and dramatic poet, author of "The Seasons." He composed his poem of "Summer" at (No. —?), Little Tower-street. A monument is placed to his memory in Westminster Abbey.
- Thoresby, Ralph (b. 1659—d. 1725), biographer and antiquary; he lived at an oil-shop, near Old Parr's Head, in Little Knight-riding-street.
- Thornhill, Sir James (b. 1676—d. 1734), historical painter; he lived at 75, Dean-street, Soho, where there is still a staircase painted by him; also on the east side of James-street, Covent-garden; also in St. Martin's-lane, in a house behind No. 104, this staircase was also decorated by him; and in 1733, in the Piazza, Covent-garden, in the second house eastward from James-street. His daughter Jane was married to Hogarth, in the parish church of Paddington.
- Thornton, Bonnell (b. 1734—d. 1771), poet and miscellaneous writer, and editor of the *Connoisseur*; was born and lived at (No. —?), Maiden-lane, Covent-garden, where his father had an apothecary's shop. In a large room at the upper end of Bow-street, nearly opposite a narrow court, once called Playhouse-passage, he opened an exhibition of sign-paintings, a piece of inoffensive drollery, from the annual Exhibition of Pictures by the Society of Artists, previous to the institution of the Royal Academy. A monument is erected to him in Westminster Abbey.
- Thurloe, John (b. 1615—d. 1667-8; when Cromwell's secretary, lived (from 1645 to 1659) in No. 24, Lincoln's-inn, and here the "Thurloe Papers" were discovered. He lies buried in Lincoln's-inn Chapel.
- Thurlow, Edward Lord (b. 1736—d. 1806), Lord Chancellor; lived, in 1784, at No. 45, Great Ormond-street, and from him the Great Seal of England was stolen on the 24th March; he also lived, in 1800, at No. 15, St. James's-square, and at No. 15, Great George-street, Westminster. He frequented Vando's coffee-house, east corner of Inner Temple-lane, Fleet-street.
- Tompion, Thomas (d. 1713), a celebrated watch-maker, had a shop at the corner of Water-lane, Fleet-street, where he died.
- Townley, Charles (b. 1737—d. 1805), collector of the Townley marbles, now in the British Museum. He lived at No. 7, Park-street, Westminster, where he died. A bust of him is in the British Museum.
- Tradescant, John (temp. Charles I.), the collector of curiosities, &c., which he bequeathed to Ashmole. He lived in what was afterwards Turret House, Lambeth. A monument to his memory stands at St. Mary's, Lambeth.
- Turner, J. M. W., R.A. (b. 1775—d. 1851), painter; was the son of a hairdresser, living at No. 26, on the north-side corner of Hand-court, Maiden-lane, Covent-garden; he also lived at No. 7, Queen Anne-street West.
- Turner, Sharon (b. 1768—d. 1847), the historian; lived for many years at (No. —?) Red Lion-square.
- Turner, William (temp. Queen Elizabeth), herbalist, and author of the first English Herbal; lived in Crutched-friars. A tablet is placed to his memory in St. Olave's Church, Hart-street.
- Tyrwhitt, Thomas (b. 1730—d. 1786), critic and antiquary, presented his collection of books to the British Museum. He lived at (No. —?) Welbeck-street, Cavendish-square.
- Underhill, Cave, actor; lived at (No. —?) Salisbury-court, Fleet-street.
- Vanbrugh, Sir John (b. 1666—d. 1726), dramatic writer and architect. He built the first Opera House in the Haymarket. He lived in Scotland-yard, Whitehall, and lies buried in St. Stephen's, Walbrook.
- Vandyck, Sir Anthony (b. 1598—d. 1641), painter; he lived and died in a house in St. Anne's, Blackfriars, and was buried in Old St. Paul's.
- Vane, Sir Harry, the Elder (b. 1585—d. 1664), statesman; lived in the Strand, next door to Northumberland-house.
- Vane, Sir Harry, the Younger (b. 1612—d. 1662), statesman; educated at Westminster School; he lived in the Strand, next to Northumberland-house, also in a house standing on the site of Evans's Hotel, the Piazza, Covent-garden. Imprisoned in the Tower, and beheaded on Tower-hill.
- Van Limput, Remigius (d. circ. 1660), painter; lived for many years on the east side of Bedford-street, Strand.
- Vere, Aubrey de, twentieth and last Earl of Oxford; lived at (No. —?) Church-street, St. James's-square, in the east corner of St. James's-square; also, from 1663 to 1676, in the north-east angle of the Piazza, Covent-garden, and finally in Downing-street, Whitehall, where he died.
- Verelst (d. 1710), painter, particularly of flower and fruit subjects; lived, in 1663, at (No. —?) Jermyn-street, St. James's, three doors from the Duchess of Richmond.
- Verrio, Antonio (b. 1634—d. 1707), painter; lived, in 1675, in Piccadilly, close to St. James's Church.
- Verstegan, Richard (d. 1650), writer on English antiquities, and etymologist; was born within the precincts of St. Katharine's, in the Tower.
- Vertue, George (b. 1684—d. 1756), engraver and antiquary; lived in (No. —?) Queen-square, Bloomsbury. A monument is erected to his memory in Westminster Abbey; a portrait of him hangs in the British Museum.
- Villiers, George, Duke of Buckingham (b. 1592—d. 1628), statesman; lived at Beaufort-house, Chelsea; also in a house which stood on the site of the present Durham-street, Strand; also in Wallingford-house, which stood on the site of the present Admiralty; also in York-house, Strand. He was buried in Westminster Abbey.
- Villiers, George, Duke of Buckingham (b. 1627—d. 1688), was born in Wallingford-house, Strand; lived in Buckingham-house, College-hill; at the Cockpit, Whitehall. He lies buried in Westminster Abbey.
- Vivares, Francis (d. 1780), landscape engraver; lived at No. 12, Newport-street, Long-acre. He lies buried in the churchyard at Paddington.
- Voltaire, Marie François Aroutet de (b. 1694—d. 1778); lodged at the White Peruke, Maiden-lane, Covent-garden.
- Wade, George, Field Marshal (b. 1673—d. 1748); lived at (No. —?) Cork-street, Burlington-gardens. He lies buried, and a monument is erected to his memory, in Westminster Abbey.
- Walker, John, lexicographer, lies buried in the churchyard of St. Pancras-in-the-Fields.
- Waller, Edmund (b. 1605—d. 1687), poet, statesman, and writer; lived, from 1654 to 1656, on the east side of Bow-street, Covent-garden; and from 1660 till his death, on the west side of St. James's-street. He was married at St. Margaret's, Westminster.
- Walpole, Sir Robert, first Earl of Orford (b. 1676—d. 1745-6), statesman and political writer; lived, in 1716, at (No. —?) Arlington-street, Piccadilly; also, about 1722, in Chelsea, in a house "next the College," adjoining Gough-house; also at (No. —?) St. James's-square, from which he removed, in 1735, to Downing-street, Whitehall, when First Lord of the Treasury; and he it was who got this house annexed to this post for ever. In 1742, when he went out of office, he purchased No. 5, east side of Arlington-street, where he died. He was imprisoned in the Tower.
- Walpole, Horace, Earl of Orford (b. 1717—d. 1797), statesman and writer. Born at (No. —?) Arlington-street. He lived at No. 5, east side of Arlington-street, until 1779, when he removed to No. 11, Berkeley-square, in which house he died.
- Walsingham, Sir Francis (b. 1500—d. 1590), statesman, and author of "The Complete Ambassador." He lived

- and died at (No. — ?) Seething-lane, Great Tower-st. A tablet to his memory was placed in Old St. Paul's.
- Walton, Brian (b. 1600—d. 1661), Bishop of Chester, and editor of the "Polyglot Bible." He lived and died at (No. — ?) Aldersgate-street.
- Walton, Izaak (b. 1593—d. 1683), author of "The Complete Angler," and other works. He lived, from 1627 to 1644, in Chancery-lane, in what was then the seventh house on the left-hand as you walk from Fleet-street into Holborn.
- Warburton, William (b. 1698—d. 1779), Bishop of Gloucester, theological writer and critic, lived at (No. — ?) Bedford-row, Bloomsbury; also in Grosvenor-square. His friendship with Pope first commenced in a bookseller's shop in Fleet-street, on the west side of the gateway leading down the Inner Temple-lane.
- Ward, Edward, commonly called "Ned," a burlesque writer, and author of "The London Spy." He lived and died at a punch-house which he kept in Fullwood's-rents, Holborn. He lies buried in St. Pancras-in-the-Fields.
- Warton, Joseph, Dr. (b. 1722—d. 1800), poet and miscellaneous writer; lodged, in 1792, at (No. — ?) Sackville-street, Piccadilly.
- Warwick, Sir Philip (d. 1682), author, and devoted Royalist in the Civil Wars. Lived, in 1661, in Outer Spring-gardens; and at (No. — ?) Warwick-street, Cockspur-street.
- Watson, James, engraver, chiefly after Sir Joshua Reynolds, lived at No. 45, Little Queen-street, Portland Chapel.
- Watts, Dr. Isaac (b. 1674—d. 1748), divine and poet; lived at Abney-park, Stoke Newington, in a house on the site of the present cemetery. He lies buried in Bunhill-fields, and a monument is erected to his memory in Westminster Abbey.
- Weber, Carl Maria Von (b. 1786—d. 1826), musical composer; died at No. 91, Great Portland-street, Oxford-street.
- Wedgwood, Josiah (b. 1730—d. 1795), the potter, and maker of the Wedgwood ware; lived in the house lately occupied by the Erechtheum Club, St. James's-square, corner of York-street.
- Wellesley, Marquis, soldier and statesman, lived and died in Listowel-house, Kensington, which stood on the site of the present Ennismore-gardens.
- Wellington, Arthur, Duke of (b. 1769—d. 1851), lived at Apsley-house, Hyde-park-corner, and died at Walmer Castle. He lies buried in St. Paul's Cathedral. He met Nelson but once, and then at the Colonial-office, 14, Downing-st., Whitehall, in a small waiting-room, on the right hand as you enter. In Battersea-fields he fought a duel with Lord Winchelsea in 1829. When in town he regularly attended St. James's Chapel, St. James's Palace. Was Constable of the Tower of London, and Master of the Trinity House.
- Wesley, John (b. 1703—d. 1792), divine, and originator of the sect called "Methodists"; was educated at the Charterhouse. His chapel is in the City-road, close to the entrance of the Bunhill-fields burial-ground, where he lies.
- West, Benjamin (b. 1738—d. 1820), President of the Royal Academy: lived in (No. — ?) Castle-street, Leicester-square; also at No. 14, Newman-street, Oxford-street, from 1777 till his death. He lies buried in St. Paul's Cathedral.
- West, James (d. 1772), President of the Royal Society, and collector of books, &c.; lived in the house now called "Evans' Hotel, Covent-garden.
- Westmacott, Sir Richard, R.A., sculptor; lived at 14, South Audley-street, Grosvenor-square.
- Wharnccliffe, James A. S. Wortley, Lord (b. 1776—d. 1845); great grandson and editor of the works of Lady Mary Wortley Montague; lived in Curzon-street, Mayfair, in the retiring house, over against the chapel.
- Whiston, William (b. 1667—d. 1752), divine and mathematician; he regularly attended St. Andrew's, Holborn, until excommunicated by Sacheverel. He lived in Cross-street, Hatton-garden.
- White, Robert (d. 1704), the engraver; lived in Bloomsbury-market.
- White, Dr. Thomas (d. 1623), the founder of Zion College; was Vicar of St. Dunstan's-in-the-West, Fleet-street.
- Whitehead, Paul (b. 1710—d. 1774), poet; he lived and died in (No. — ?) Henrietta-street, Covent-garden.
- Whitelocke, Bulstrode (b. 1605—d. 1675), statesman under Cromwell, and author of the "Memorials of English Affairs from Charles I. to the Restoration of Charles II.," baptised in St. Dunstan's-in-the-West; educated at the Merchant Taylors' School. Was a Templar.
- Wilkes, John (b. 1727—d. 1797), politician; he lived and died at No. 30, Grosvenor-square, and lies buried in Grosvenor Chapel. An obelisk stands to his memory in Fleet-street. He was an alderman of the ward of Farringdon Without.
- Wilkie, Sir David, R.A. (b. 1785—d. 1841), painter; lived at Sol's-row, Hampstead-road; also at 11, Norton-street, Portland-road, Kensington; and 24, Lower Phillimore-place, Kensington; his last residence was Vicarage-place, Kensington. He frequented Slaughter's Coffee-house, St. Martin's-lane. A statue to his memory stands at the National Gallery.
- Wilks, Robert (b. 1666—d. 1731-2), actor, called "Gentleman Wilks;" lived at Bow-street, Covent-garden, in the sixth house on the west side as you walk to Long-acre. He lies buried in St. Paul's, Covent-garden.
- Williamson, Sir Joseph, Secretary of State, and the second President of the Royal Society, lived in St. James's-square.
- Willis, Dr. Thomas (b. 1622—d. 1675), the physician; lived at (No. — ?) St. Martin's-lane.
- Wilson, Richard, R.A. (b. 1714—d. 1782); lived, in 1777-8 at No. 24, Norton-street, Portland-row; also in the house now Tavistock-hotel, the Piazza, Covent-garden; also at No. 85, Great Titchfield-street, in 1779; and in 1780 in Tottenham-street, Tottenham-court-road.
- Winchelsea, George, Earl of (b. 1791). Was living in No. 7, Suffolk-street, Haymarket, when challenged by the Duke of Wellington, in 1829.
- Wolcot, John (b. 1738—d. 1819), known as "Peter Pindar," satirist and poet; lived, in 1800, at No. 1, Chapel-street, Portland-place; also lodged on the first-floor of (No. — ?) Pratt-place, Camden-town; and at No. 13, Tavistock-row, Covent-garden. He died in a house which stood on the site of Euston-square, and lies buried in St. Paul's Covent-garden.
- Wollaston, Dr. William Hyde (b. 1766—d. 1828), chemist and philosopher. He lived, in 1800, in No. 18, Cecil-street, Strand. A portrait of him hangs at the Royal Society.
- Woollett, William (b. 1735—d. 1785), engraver; lived in Long's-court, Leicester-fields; and from here he moved to No. 11, Green-street, Leicester-fields. He lies buried in the churchyard of St. Pancras-in-the-fields.
- Worde, Wynkyn de, the celebrated printer, lived at (No. — ?) Fleet-street, at the "Sign of the Sonne;" lies buried in St. Bride's, Fleet-street.
- Wren, Sir Christopher (b. 1635—d. 1723), architect; was educated at Westminster School. He lived in Dulwich, in a large red house, on the right-hand side of the road from the "Elephant and Castle," over Camberwell-green; also in Scotland-yard, Whitehall; and in No. 5, Walbrook. He was married a second time in St. James's Chapel, and lies buried in St. Paul's Cathedral. A portrait of him hangs at the Royal Society, of which he was a Fellow. He designed the following

churches in London:—St. Alban's Church, Wood-street.; Allhallows-the-Great, Upper Thames-street; St. Andrew's, Holborn; St. Anne's-within-Aldersgate; St. Anthony's, in Budge-row; St. Augustine's, Watling-street; St. Bennet-Fink; St. Bride's, Fleet-street; St. Clement's Danes, Strand; St. Clement's, Eastcheap; St. Dionis Backchurch, Fenchurch-street; parts of St. Dunstan's-in-the-East; St. George's, Botolph-lane, Billingsgate; St. James's, Piccadilly; St. James's, Garlickhithe; St. Lawrence, Jewry; St. Magnus, London-bridge; St. Margaret's, Lothbury; St. Margaret Pattens; St. Martin's Ludgate; St. Mary Abchurch; St. Mary, Aldermay; St. Mary-le-Bow, or Bow Church, Cheapside; St. Mary Magdalen, Old Fish-street; St. Mary Somerset, Thames-street; St. Michael's, Crooked-lane; St. Michael's, Wood-street; St. Nicholas, Old Fish-street; St. Paul's Cathedral; St. Peter's, Cornhill; St. Stephen's, Coleman-street; and St. Swithin's, by London Stone. He also designed Temple-bar; the College of Physicians, Warwick-lane, Newgate-street; and the Monument.

Wycherley, William (b. 1640—d. 1715), comic poet; was a Templar, and lived on the west side of Bow-street, Covent-garden, and lies buried in St. Paul's, Covent-garden.

York, Philip, Lord Hardwicke (b. 1690—d. 1764), celebrated lawyer and Lord Chancellor; was articled to an attorney in Brook-street, Holborn; he lived for twenty years in the second Powis-house, Great Ormond-street.

Young, Edward (b. 1681—d. 1765), poet, author of "Night Thoughts," was married at Mary-at-Hill Church, Bishopsgate.

Zoffany, John, R.A. (b. 1735—d. 1810), theatrical portrait painter; lived in the Piazza, Covent-garden (the north-east wing); also at No. 9, Denmark-street, St. Giles's.

Proceedings of Institutions.

EXAMINATION PAPERS, 1868.

The following are the Examination Papers set in the various subjects at the Final Examination held in April last:—

ARITHMETIC.

THREE HOURS ALLOWED.

1. The fore-wheel of a coach is $8\frac{1}{2}$ feet round; the hind wheel $12\frac{1}{2}$ feet round. How many more revolutions will the former make than the latter in the course of a mile and a quarter?
2. How many English ells of cloth, at 19s. $9\frac{1}{2}$ d. per ell, should be given in exchange for 47 yards 2 qrs., at 17s. 5d. per yard?
3. If £7 14s. 7d. pay the wages of 10 men and 3 boys, how many persons will £12 19s. 7d. pay, a man earning 5 times as much as a boy?
4. If 2 engines of 12 horse-power raise 3,200 gallons of water from a depth of 75 fathoms in 45 minutes, in what time would the same engines raise 4,000 gallons from a depth of 50 fathoms?
5. Find by Practice the value of $267\frac{3}{4}$ cwts. of sugar at £2 14s. 6d. per cwt.
6. Calculate the value of 215 acres, 1 rood, 20 poles, at £2 10s. 6d. per acre.
7. How many articles, bought at 1s. $4\frac{1}{2}$ d. each, must I sell at 1s. 9d. to make a profit of £2 14s.?
8. What will be the carriage of $\frac{3}{8}$ cwt. for 80 miles at the rate of a farthing a lb. per mile?
9. In what time will £164 5s. at 5 per cent. per annum, gain the same interest as £75 12s. 6d. gains in $18\frac{1}{2}$ years at $4\frac{1}{2}$ per cent. per annum?
10. A and B work together for a fortnight; A works

9 hours a day throughout; B works ten hours a day the first week, but only 7 hours a day the second. They earn £11 1s. 8d. How much ought each to receive?

11. Exchange into decimal coinage 1,000 francs 50 centimes, the rate of exchange being 25 francs 17 centimes per £.

12. An income of £150 10s. is liable to a tax of £4 7s. 6d. What is the tax on £361 4s.? Work by decimal currency, a £ being the unit.

13. Change £32 into French money at the rate of 25 francs 80 cents per £.

14. Subtract 3 roods, 39 poles, 30 square yards, 2 square feet, 35 square inches, from 1 acre.

15. What is the difference between the simple and the compound interest of £350 for 3 years, at 5 per cent. per annum?

16. If a ship be insured for $91\frac{1}{2}$ per cent. of its value, the whole value being £6,968, what would a person lose who owned $\frac{2}{3}$ of it in the event of its being lost?

17. By selling sugar at 6d. per lb. a grocer clears $\frac{1}{4}$ of his outlay. He lowers the price to $5\frac{1}{2}$ d. What does he now clear percent.?

18. If goods worth £1,200 are to be insured at $1\frac{1}{2}$ per cent, to what amount must they be insured so that in case of loss the person insuring them may recover the value of both the goods and the premium?

19. During the first six months of the year the income tax is 7d. per £; but during the last six months it is 5d. per £: what is the gross annual income of a gentleman who receives £819 after deducting income tax for the year?

20. Bought wheat at 61s. a quarter, payable in 4 months: how must I sell it the same day so as to make my immediate gain $5\frac{1}{2}$ per cent., giving 7 months' credit?

21. A can do $\frac{1}{4}$ of a work in 4 hours; B can do $\frac{1}{4}$ of the remainder in 2 hours; and C can then finish it in 20 minutes. In what time could the three together perform the work?

BOOK-KEEPING BY DOUBLE ENTRY.

THREE HOURS ALLOWED.

1. Journalise and post, in proper technical form and language, the following imaginary transactions, and make out from the ledger a trial balance, a profit and loss account, and a balance-sheet.

On 1st January, 1868, D. Scott has assets and liabilities as follows:—

ASSETS.		£	s.	d.
Business premises, valued at	500	0	0	
Wine	2,000	0	0	
Due by J. Wall	205	0	0	
Bills receivable	352	0	0	
Cash	605	12	4	

LIABILITIES.

Bills payable	557	0	0
Due to W. Brown	44	0	0

On 1st January, 1868, T. Jones is taken into partnership. T. Jones's capital is composed of brandy valued at £2,000 and £1,000 in cash.

N.B.—The capital and drawings of the partners are subject to interest at 5 per cent. per annum, and the net balance of profit and loss is divisible equally between them.

1868.		£	s.	d.
Jan. 1	Advanced for petty cash	10	0	0
" "	" Paid cash for purchase of additional business premises	200	0	0
" 3	Discounted S. Nokes's acceptance for £200, and received in cash £197 10s., and allowed for discount £2 10s.	200	0	0
" 6	Brought wine for cash	342	10	0
" "	" Sold brandy for cash	845	0	0
" "	" Paid cash for our acceptance to J. Wilson due this day	257	0	0

Jan. 9	Bought brandy of F. Black	400	0	0
" 10	Cash drawn out by D. Scott	200	0	0
" 13	Sold G. Green wine	500	0	0
" "	Received from G. Green (and cancelled) our acceptance to him..	300	0	0
" "	Received G. Green's acceptance to us at two months.....	200	0	0
" 14	Received amount due by J. Wall—viz., £200 in cash, and allowed for discount £5	205	0	0
" 16	Paid amount due to W. Brown—viz., £42 in cash, and received for discount £2	44	0	0
" 20	Sold J. Wilson brandy	240	0	0
" "	Sold, ditto, wine	800	0	0
" "	Received J. Wilson's acceptance at twenty-one days	1,040	0	0
" 25	Received consignment of cigars from J. Thompson, invoiced at	100	0	0
" 30	Bought of J. Wall, the schooner <i>Dolphin</i>	2,000	0	0
" "	Paid J. Wall, cash	1,000	0	0
" "	Accepted J. Wall's draft at two months	1,000	0	0
" 31	Paid salaries of clerks	30	0	0
" "	Received Johnson and Son's account for carriage of wine during the month of January	4	3	0
" "	Trade charges paid out of petty cash to this date	8	9	0
	Interest on amount of capital drawn out by D. Scott.....	11	6	
	Interest on D. Scott's capital....	12	15	2
	" T. Jones's "	12	10	0
	Estimated wear and tear of business premises.....	10	0	0
	Stock of wine on hand	1,250	0	0
	Stock of brandy on hand	1,310	0	0

2. What is the use of a trial balance?

3. How is the profit-and-loss account affected?

(1.) If expenditure which ought to have been charged to it is charged to capital?

(2.) If receipts are credited to it which ought to have been credited to capital?

4. If, on examining the books, it be found that the following entry:—"Interest on T. Jones's capital £12 10s.," has been journalised and posted as if it had been "interest on amount of capital drawn out by T. Jones, £12 10s.," what journal entry or entries would be necessary to correct the error?

ALGEBRA.

THREE HOURS ALLOWED.

1. Explain the ordinary system of arithmetical notation.

Show that, if a number of six figures be formed by the repetition of any three figures in the same order, the resulting number will be divisible by 7, 11, and 13.

2. If $ax^2 + bx + c$, and $ax^2 + mbx + m^2c$ have a common measure, then $(m+1)^2ac = mb^2$.

3. Simplify the expressions,

$$\left(\sqrt{\frac{a+x}{x}} - \sqrt{\frac{x}{a+x}}\right)^2 - \left(\sqrt{\frac{x}{a}} - \sqrt{\frac{a}{x}}\right)^2$$

$$1 + \frac{x}{a} + \frac{a}{x} + \frac{x^2}{a^2} + \frac{a^2}{x^2} + \left(\frac{x^3}{a^2} - \frac{a^3}{x^2}\right) \frac{1}{x-a}$$

4. A man having a capital of £P spends it all in the purchase of certain shares, each of which pays a dividend of £d; and he buys at such a rate that, when the shares have risen £r each, he gains £q by selling out. When the shares have fallen to their original price he again invests all his money in them. Find the alteration in his income, supposing a brokerage of £b a share is paid for purchasing.

5. Solve the equation $ax^2 + bx + c = 0$

If α β be its roots, prove that

$$ax^2 + bx + c = a(x-\alpha)(x-\beta)$$

6. Determine the number of permutations which can be formed out of n things taken r at a time.

7. State and prove the algebraical theorem upon which the arithmetical "Double Rule of Three" depends; and make and work out an example in illustration of it.

8. The arithmetic mean between two numbers exceeds the harmonic by 1, and twice the square of the arithmetic mean exceeds the sum of the squares of the geometric and harmonic means by 11; find the numbers.

9. Write down the r th term of $(a-x)^n$.

If $a_0, a_1, a_2, \&c.$, be the co-efficients of the 1st, 2nd, 3rd, $\&c.$, terms respectively, of the expansion of $(1+x)^n$, find the value of $a_0 a_1 + a_1 a_2 + a_2 a_3 + \&c., \dots + a_{n-1} a_n$.

10. Prove that the difference between the interest and discount upon any sum is the interest upon the discount.

If this difference for £420 for one year be £1, find the rate per cent.

11. A man throws with three dice on the condition that, if he throws 10 exactly he shall receive a sovereign; find the value of his expectation.

12. Sum the series $1 - 3 + 5 - 7 + \&c.$ to n terms.

(To be continued.)

Fine Arts.

WORKS OF ART EXECUTED OR PLACED IN PUBLIC BUILDINGS IN FRANCE.—The catalogue of the annual exhibition of works of art in Paris contains a very interesting addendum, namely, the list of paintings and sculpture executed during the past year, by order of the Government, or purchased for the decoration of public buildings, and other monuments. The list for 1867-68 is as follows:—

PAINTING.

Balze, Paul—Three paintings in *faisence*, for the vestibule of the new church of La Trinité, Paris.

Brisset, P. N.—Two paintings in the Chapel of the Virgin, in the new church of St. Augustin, Paris.

Brunner-Lacoste, Henri—Ceiling and decorative paintings in the hôtel of the Sous-prefecture of Sceaux.

Cazes, Romain—Mural paintings in the churches of Notre Dame de Clignancourt, and du Jesu.

Delaunay—Two paintings in the Chapel of the Virgin in the church of La Trinité.

Denuelle—Restoration of a gallery in the palace of Fontainebleau; decorations in the reception-rooms at Versailles; church of La Trinité; the Préfecture of Grenoble; and the Pavillon Denon of the New Louvre.

Desgoffes, Alexander—Paintings in the new reading-room of the Bibliothèque Impériale.

Doze, J. M. M.—Paintings in the churches of St. Ger-vasy, Gard, and Sainte Perpétue, at Nismes.

Dupuy-Delaroche—Painting in the sanctuary of the church of La Feuille.

Gonézou, Joseph—Death of St. Louis, in the church of Notre Dame de Bon Port, Nantes.

Guiaud, Jacques—Six compositions in the palace of Fontainebleau.

Hesse, J. B. A.—Three paintings in the churches of St. Gervais and St. Protais, Paris.

Lamothe, Louis—Decorations in the churches of the Jesuits, Paris, and St. Iréné, at Lyons.

Le Henaff, A. F.—Two paintings in the chapel of St. Hilaire, and church of St. Etienne du Mont, Paris.

Lenepveu, J. E.—Eight paintings in the chapel of the Hospice of St. Marie, at Angers; four in the Prefecture

of Grenoble; and two in the church of St. Clotilde, Paris.

Maganil, D. A.—Ceiling and four panels at the Prefecture of Marseilles.

Ulmann, Benjamin—Three compositions in the Court of Cassation, Paris.

Vibert, Jules—Painting in the chapel of La Miséricorde, at Bayeux.

SCULPTURE.

Auvray, Louis—Monumental bust of Condillac, for the Prefecture of Grenoble.

Bertaux, Madame Léon—Two figures of saints in stone, for the church of St. Laurent, Paris.

Caillé, J. M.—Two caryatides, for the Place de la Trinité, Nantes.

Chambart, Louis L.—Statues of Mercury, in the court of the Tuileries, and of Jupiter, for St. Cloud.

Chatrousse, Emile—Statue for the church of St. Ambroise, Paris.

Courtet, Augustin—Two statues for the façade of the church of St. Laurent, Paris.

Dantan, J. P., jun.—A statue for the church of La Trinité, Paris.

Dumont, A. A.—Marble bust of Alexander Lenoir, founder of the Musée des Monuments Français, for the Ecole des Beaux Arts.

Etex, Antoine—Tomb of Louis Martinet, in the cemetery of Père La Chaise.

Girard, Noel Jules—"Comedy and Drama," façade of the new Opera-house, Paris.

Gruyère, T. C.—Bas-relief for the church of St. Thomas D'Aquin, Paris; and for the façade of the Opera-house.

Hébert, Emile—Groups, "Comedy" and "Drama," façade of the new Vaudeville Theatre.

Iguel, Charles—Composition for the *fronton* of the hospital of Roubaix; and bust of Sebastian Bach, for the Conservatoire of Paris.

Jouindot, Amédée—Decorations in bronze for the Fountain of the Three Graces, at Bordeaux.

Lavigne, Hubert—Bas-relief, for the façade of the Chapelle of Chantemerle.

Le Harivel-Durocher, Victor—Four statues in stone.

Maniglier, H. C.—Bas-relief, "Science and Art," for the new Opera-house.

Mathieu-Meusnier, Rolland—Statue, "The Goldsmith," court of the Louvre.

Meunier, Louis—Group, in copper *repoussé*, of the Archangel overthrowing Satan, for the roof of the chapel of the Château of Pierrepont.

Michel-Pascal, François—Sculptures for the churches of Sainte-Croix and St. Ferdinand, Bordeaux, and for the Sous-prefecture of Mirande.

Petit, Jean—Statues of Castor and Pollux, for the façade of the Tuileries; and bas-relief, "The Muses of Architecture and Industry," for the façade of the Opera.

Pêtre, Charles—Marble group for the church of Drancy.

Poittevin, Philippe—Fronton for school-house at Chambéry.

Robert, L. V. E.—Two caryatides, for the façade of the Opera; statues of "Agriculture" and "Industry," for the Orleans Railway-station.

Rouillard, Pierre Louis—Eight eagles, for the new Opera-house; and lions, for the piers of the bridge of Arles.

Salmon, Jean Jules—Caryatides, "Folly," "Comedy," "Satire," and "Music," for the new Vaudeville Theatre.

Sobre, Hyacinthe—Fronton, "Work and Pleasure," for the Opera.

Truphème, François—Fronton, "The Evening Hours," for the Opera-house.

It is worthy of remark that, in the majority of cases, commissions for the provinces are given to artists residing in, or natives of, the same town or department; and of the fifty artists whose names appear in the above list, less than half are natives of Paris.

Commerce.

THE PRODUCTION OF WAX AND HONEY IN ITALY.—The Italian peasantry, as a rule, take but little care of their bees, the hives are generally of wood, and the bees are destroyed in order to get the honey. The following is the production of honey in Italy:—

	Quantity Kils.	Amount Francs.
Piedmont and Liguria....	380 000	.. 300,000
Lombardy	179,880	.. 170 000
Venetia	174,160	.. 165,000
Emilia, Umbria, and the Marches	189,840	.. 190,000
Other Provinces	600,000	.. 560,000
Total	1,523,880	.. 1,385,000

The best honey is that of Bormio, in Lombardy, that of Empoli in Tuscany, and that of Otranto. The exports of honey from Italy are very small. The production of wax is as follows:—

	Quantity. Kils.	Amount. Francs.
Piedmont and Liguria	75,000	.. 350,000
Lombardy	72,000	.. 340,000
Venetia	59,920	.. 250,000
Emilia, Umbria, and the Marches	33,900	.. 150,000
Other provinces	140,000	.. 500,000
Total	380,820	1,590,000

About two-thirds of this quantity are used for making wax-candles, and the rest is bleached and moulded into cakes for sale. As the production of wax in Italy is not in proportion to the consumption, a great deal of raw wax is imported, the best quality being supplied from Moldavia, Wallachia, Bosnia, and the Archipelago; the second quality from Poland, Hungary, Transylvania, Africa, and America; the third quality from the islands of Cuba and St. Domingo. The following are the imports of this substance from 1863 to 1865:—

	Quantity. Quintals.	Amount. Francs.
1863	9,517	3,996,000
1864	8,436	3,532,000
1865	8,517	3,591,000
Average	8,823	3,706,000

RECEIPTS OF THE ITALIAN RAILWAYS.—In 1867, the total length of the railways opened to public traffic was 4,805 kils., of which 151 kils. were opened during the year. The total receipts were 76,254,815frs. The total number of passengers amounted to 14,433,430. The goods per "grand vitesse" amounted to 94,606,206 kils., of which 4,284,691 kils. cocoons; 15,626,588 kils. articles of food; and 72,920,062 kils. parcels. These do not include the transport of carriages, horses, &c. The goods carried per "petite vitesse" amounted in all to 28,888,345 kils., the principal items being grain, wine, and spirits, coal, timber, and marbles.

COMMERCE OF ALGERIA.—The general commerce of the colony of Algeria, in 1867, including both exports and imports, amounted to 284,838,990 francs, showing an increase on that of 1866 of 12,941,156 francs. The exports amounted to 97,161,983 francs, an increase of 4,429,076 on those of the previous year, and the imports to 187,677,007 frs., principally in wheat and flour, drawn from France and other foreign countries, in consequence of the failure of the harvest. The value of the produce of the soil and manufactures from France was 143,871,466 francs; next to France comes Turkey, the states of Barbary, Spain, and Russia, and then England, for a sum of 4,879,563 frs. only, including articles of consumption, iron, coal, and woollen goods. A curious circumstance is, that in the above total, the port of Oran takes

the greatest share, namely, 69,284,707 frs., or 36·93 per cent., and Algiers, only 66,758,241, or 35·58 per cent. In exportation cattle represent an amount of 10,717,248 frs.; skins, 4,319,285 frs.; and oils, 5,868,443 frs.

THE BEETROOT CROP.—Messrs. Arnold, Baruchson, and Co. give the following account of the position and prospects of the beetroot crop, in their circular, dated Douai, 1st July:—"At one time, the uninterrupted dry weather began to create great uneasiness; and although since then some slight showers have refreshed the plant, more rain is indispensable to neutralise the effects of the long-continued tropical heat; much greater mischief might, however, have been done, if the leaves, which shelter the root from the burning sun, had been less developed. It is impossible to give, as yet, any positive information as to the extent of damage, if any, done to the plant, except that the high state of temperature has greatly increased the number of insects, which, even in favourable seasons, always injure, more or less, the root, and which rains alone can help to destroy."

Colonies.

QUEENSLAND COTTON-GROWING.—A Brisbane paper says:—"The cotton season is being got through very satisfactorily, in so far as quality and quantity of crop are concerned, but the prices offered are very low. Unless there is an advance it is not likely that cotton-growing will extend here; the labour of packing and the expense of ginning, monopolise nearly the whole of what the staple at present fetches. Those growers who are in a position to do so, intend to keep back their cotton, in anticipation of an advanced price. One reason for regret that our growers should be driven into this course, is the uniformly high quality of this season's crop, which, did it reach Europe in quantity, could not fail to draw attention to this as a cotton-producing country. In length of staple, strength, and general appearance, it is greatly superior to that of the first few years' cotton grown here. The characteristics of the plant are also changing rapidly, and on not a few plantations have we seen samples peculiar to this colony. The seed will be retained and planted separate, so that the merits of the new varieties will have a fair chance of developing. Amongst others, we have been shown a plant of what is evidently a hybrid between Sea Island and Egyptian; it has every appearance of a really valuable variety."

TEA IN QUEENSLAND.—A sample of tea manufactured from leaves taken from plants in the Botanical Gardens in this colony, by a Chinese firm, has been shown there. The principal of the firm appears to understand the process tea has to undergo before it is suited to the European taste; and the present sample bears a strong resemblance to orange pekoe.

SUGAR IN NEW SOUTH WALES.—Not long since the first parcel of colonial sugar, consisting of 120 bags and 34 casks of treacle, grown at Hastings, was submitted for competition in this colony. A portion of it made £34 per ton, and the remainder £33. This end has been effected by perseverance for some time, and it is hoped it will be continued, as there has been at last produced sugar from the cane, the produce of the soil of the colony, manufactured by colonial machinery; an article which must therefore be looked upon as a purely colonial product.

MEAT PRESERVING.—The Melbourne sheep and bullock farmers are looking with some favour on the establishment of a meat preserving company, under the impression that by this means they may get rid of their surplus meat on better terms than by merely boiling it down for tallow. For the present, Mr. Ritchie's mode of tinning meat is the one to be carried out. £50,000 is to be the nominal capital, but it is not intended to confine operations to this mode; the company holds itself open to any, and Mr. Mort's would be preferred (says the *Sydney Mail*), were the experiments a little further advanced.

Notes.

OXYHYDROGEN LIGHT.—The experiments commenced last year on the Place de l'Hôtel de Ville, in Paris, on the oxyhydrogen light, are about to be continued, by order of the Emperor, in the court of the Tuileries. The magnesia cylinders having been found to corrode and waste away too rapidly for the purposes of a continuous light, an artillery officer, M. Caron, after experimenting with a variety of substances, has adopted zircon, a substance which Berzelius pointed out as infusible, and giving forth a very brilliant light under the blowpipe. It is said that M. Caron has had a cylinder of this substance in use with the oxyhydrogen light for a month without the slightest trace of volatilization. The luminous power of zircon, under the oxyhydrogen jet, is about one-fifth more than that of magnesia. The zircon employed is an oxide of zirconium; it is found principally near Miask, at the foot of the Ural mountains. M. Caron economises the zircon, by mounting a point of it on a small stick of magnesia or fire-clay, the zircon being made to adhere by compression and afterwards baking.

THE FOUNDATIONS OF THE OLD LOUVRE.—The municipal government of Paris caused a very careful examination to be made last year of the remains of the old Louvre, the fortified castle of Philip Augustus, which lie beneath the enclosed court or square of what is now called the Old Louvre, and it was found that the ideas respecting this ancient edifice were very erroneous. The base of the Donjon-tower, which figures conspicuously in history, was found intact, and only a few feet beneath the present surface of the ground. An admirable method has been adopted, of recording the form of the ancient fortress; the entire ground-plan has been laid in black and white asphalt, except where the old building lies beneath the pavement of the present court, in which case granite has been used to represent the foundation of the old building. There is an immense advantage in thus bringing so interesting a remnant of a bygone age bodily, as it were, under the eye of the public. Engravings would, of course, perpetuate the lines for all those who sought for information respecting them, but the method adopted will arrest the attention of many, and lead to inquiry.

INTERNATIONAL EXHIBITION IN CHILI.—An exhibition of machines, apparatus, animals for breeding, agricultural produce, dried meats and vegetables, timber, textile fibres, liquors of all kinds, and models for farm and rustic buildings, is announced to open at Santiago, the capital of the republic of Chili, on the 15th of September in the present year, and all the world is invited to contribute. There are to be five classes of medals, one grand medal of honour, and others of gold, silver, and bronze. Applications are to be made, before the 10th of August, to MM. Germain and Hermanos, commissioners, Paris and Havre, or to the Chilean consuls.

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

- Par.
Numb.
206. Bill—General Police and Improvement (Scotland) Act Amendment.
203. (5.) Railways Abandonment—Report of the Board of Trade.
335. Turnpike Trusts—Return.
360. Metropolitan Board of Works—Return.
371. Army (Artillery and Engineer Colonels)—Return.
Abyssinian Expedition—Further Correspondence.

Delivered on 4th July, 1868.

174. Bill—Court of Judiciary (Scotland) (amended).
207. " Inland Revenue.
130. (v.) Railway and Canal Bills—Sixth Report.
349. Turnpike Trusts—Return.
373. War Office (Control Department)—Correspondence.
Public Petitions—Twenty-ninth Report.

Delivered on 6th July, 1868.

209. Bill—Petit Juries (Ireland) (as amended by the Select Committee.)
 170. Navy (Health)—Statistical Reports.
 286. Harbour Loans—Return.
 338. Coals, Cinders, and Culm, &c.—Accounts.
 361. Public Bills (Ireland and Scotland)—Return.
 381. New Courts of Justice—Letter.

Delivered on 7th July, 1868.

208. Bill—Indorsing of Warrants.
 210. " Salmon Fisheries (Scotland).
 128. (r.) Navy (Channel Fleet)—Report.
 270. East India (Finance and Revenue Accounts)—Parts I. and II. Accounts, Estimate, &c.
 380. Roman Catholic University (Ireland)—Further Correspondence.
 Public General Acts—Cap. 31 to 40.

Delivered on 8th July, 1868.

151. (iv.) Trade Accounts (Foreign Countries)—Belgium, Holland, France, and United States.
 265. House of Commons (Arrangements)—Report.
 318. Boundaries of Boroughs—Petitions, Letters, &c.
 364. West India and Brazil Mails—Contract.
 391. South Sea Islanders (Queensland)—Extracts of Correspondence.
 The Danube—Convention.

SESSION 1867.

431. (B 1.) Poor Rates and Pauperism—Return (B).

Delivered on 9th July, 1868.

212. Bill—Public Departments Payments.
 215. " Representation of the People (Scotland) (Lords Amendments).
 216. " New Zealand Assembly's Powers.
 218. " Tithe Commutation, &c., Acts Amendment.
 316. Shipping—Return.
 372. Bristol Election Petition—Minutes of Evidence.
 375. West India Mails—Correspondence.
 376. Brazils and River Plate Mails—Correspondence.
 380. Roman Catholic University (Ireland)—Corrected Paper.
 387. Oyster and Mussel Fisheries Act (1866)—Report.

Delivered on 10th July, 1868.

214. Bill—Court of Session (Scotland) (amended on re-commitment).
 217. " Vaccination (Ireland).
 219. " Trade Societies and Combinations of Workmen.
 221. " Mines Assessment (amended on re-commitment).
 222. " Sanitary Act (1866) Amendment.
 223. " Land Drainage Provisional Order Confirmation.
 225. " Army Chaplains.
 239. East India (Contract Law)—Papers, Reports, &c.
 244. East India (Education)—Report.
 322. Poor Law (Ireland)—Returns.
 362. Slave Trade—Return.
 390. Petit Juries (Ireland) Bill—Special Report.
 Customs—Twelfth Report of the Commissioners.

Patents.

From Commissioners of Patents' Journal, July 10.

GRANTS OF PROVISIONAL PROTECTION.

- Band-saw machines—1864—G. Finnegan.
 Bobbins, machinery used in the manufacture of—2070—J. Tyson.
 Boilers—2021—C. Johnson.
 Boilers, apparatus applicable to, for utilising waste heat, &c.—2037—M. and J. Mackie.
 Boots and shoes—2015—G. Taylor.
 Boots and shoes, ventilating—2039—G. Smith.
 Bottles, apparatus for cleansing—2052—C. D. Abel.
 Brick machines—2023—A. V. Newton.
 Buildings, heating—1478—J. M. Stanley.
 Carding engines—2032—N. C. Underwood.
 Cards for carding—2011—W. A. Gilbee.
 Carriage doors, &c.—2010—W. E. Gedge.
 Carriages, coaches, &c.—2030—W. Carr.
 Ceramic matters, &c.—1972—A. M. Clark.
 Chairs, folding—2022—A. V. Newton.
 Chairs, folding—2054—M. Burke.
 Charcoal, animal, charring and preparing—2031—J. Gregory.
 Chess boards and chess men—1992—G. Owen.
 Colours, crystal brocatel, obtaining—1945—C. E. Schwartz.
 Cotton, &c., drawing rovings, &c., of—1978—G. F. Redfern.
 Cotton, &c., preparing—2058—J. Taylor.
 Dredging machines—1959—D. Elder.
 Educational apparatus for illustrating steam propulsion—2028—C. T. Sutton.
 Electric conductors, coating—2012—M. Gray and L. Gibson.
 Electro-magnetic machines, &c.—2060—F. H. Holmes.
 Fabrics, woven, machinery for finishing—1976—A. Cochran.
 Fenders, &c.—1951—T. Kendrick.
 Fibrous materials, preparing for combing, &c.—2007—W. Tongue.
 Fire-arms and cartridges—2018—C. M. H. Downing.

- Fire-arms and cartridges—2049—G. T. Bousfield.
 Fire-arms, breech-loading—2066—R. Warry.
 Furnaces—2034—J. Mitchell.
 Gas—1980—C. Hengst and H. Watson.
 Gas—1948—L. S. Thomassin.
 Guns, cartridges, and bayonets—2038—T. Restell.
 Harbours and docks, cleaning—2068—C. Mather.
 Hats, &c., ventilating—1876—R. Husband.
 Ingot moulds, constructing—2043—J. Briggs.
 Lime and cement, burning—2041—R. Elsdon.
 Looms—2056—R. Clough.
 Meats and fruits, preserved, packing for sale—2063—T. C. Blanch flower.
 Mill bills and picks—2014—C. Whitehouse.
 Millstones, apparatus for dressing—2050—J. Hine.
 Millstones, instrument for ascertaining irregularities in the surfaces of—2024—P. and B. Brown.
 Motive-power apparatus—1988—M. P. W. Boulton.
 Neckties, &c., fastenings for—2057—S. S. Maurice.
 Needles, polishing—2008—E. T. Hughes.
 Oxide of manganese, obtaining—2072—W. F. Deane.
 Pill-making machines—1974—J. and E. Lumley.
 Printing machines, lithographic, &c.—1986—D. and J. Greig.
 Railway trucks, &c., covering and uncovering—2053—T. Dodd.
 Reaping and mowing machines—2020—J. and A. Douglas.
 Reaping and mowing machines—2025—C. T. Burgess.
 Reaping and mowing machines, sharpening the cutters of—1982—J. Hemington.
 Rick cloths—2047—J. G. Garrard.
 Rotary engines—1983—E. R. Kaulbach.
 Rotatory engines and pumps—2006—R. and W. K. Austin.
 Rock, &c., boring—1989—F. B. Doering and R. H. Twigg.
 Sewing machines, &c., actuating—2046—A. D. Aulton.
 Ships' bottoms, preventing the fouling of—2076—R. Smith.
 Ships, sailing, applying auxiliary screw propellers to—2044—J. Jack.
 Steam engines—1993—W. Umpherston.
 Steam engines, &c.—2002—J. Sheldermine, W. Walker, and E. Holt.
 Stench traps—1996—A. A. Common.
 Stone or slate, artificial—2048—H. Highton.
 Straps and belts—2000—C. H. Murray.
 Straw shakers, &c., actuating—2016—J. Hayes, sen., and J. Hayes.
 Thread, winding—2013—A. M. Clark.
 Type setting and distributing machines—1984—A. Mackie.
 Waterclosets—2059—A. Thomson.
 Water, distilling pure from salt—2061—L. Thomas.
 Water pipes, protecting from injury by frost—2029—B. T. Moore.
 Wheat, cleaning and decorticating—1998—J. Hadley.
 Wool, &c., carding and spinning—2019—H. A. Bonneville.
 Woven fabrics, preparing—2045—E. Lever.
 Yarns, finishing—2051—C. Hastings, J. Briggs, and J. Law.
 Yarns or threads, treating certain waste—1994—G. H. Midwood.

INVENTION WITH COMPLETE SPECIFICATION FILED.

- Fibrous substances, spinning, &c.—2124—C. Roussel.

PATENTS SEALED.

- | | |
|---|--------------------------------------|
| 90. O. H. McMullen. | 181. H. A. Bonneville. |
| 101. C. S. Lemon. | 192. T. G. F. Dolby. |
| 114. T. S. Ellin. | 294. A. Pickering. |
| 121. W. E. Gedge. | 336. J. Walker and J. Hudson. |
| 125. J. C. Ramsden. | 350. J. V. Jones and G. J. Williams. |
| 126. T. Sagar and T. Richmond. | 538. A. M. Keighley. |
| 128. F. and I. Alekan. | 826. J. Vero. |
| 129. W. E. Gedge. | 1488. W. E. Newton. |
| 141. T. Travis, W. H. Prince, and J. Tomlinson. | |

From Commissioners of Patents' Journal, July 14.

PATENTS SEALED.

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|------------------------------|-----------------------------------|
| 130. L. M. Becker. | 222. J. Dixon. |
| 132. J. Lang. | 226. W. Thompson & T. Stather. |
| 133. D. Hodgson and J. Dodd. | 244. H. J. Dickinson. |
| 135. W. Ayliffe. | 260. G. Severn. |
| 136. J. Williamson. | 272. F. Wirth. |
| 143. J. J. Ashworth. | 279. W. E. Rendle. |
| 145. R. Schneider. | 300. A. C. Pilliner & J. C. Hill. |
| 152. T. Nash. | 317. W. E. Newton. |
| 153. G. E. Reading. | 322. J. Grimes. |
| 162. J. Hosking, jun. | 351. R. C. Smith. |
| 164. H. Aitken. | 395. W. E. Newton. |
| 166. J. M. Napier. | 423. J. B. Wilson. |
| 167. D. A. Fyfe. | 611. W. E. Newton. |
| 172. J. Millward. | 1065. J. Macintosh & W. Boggett. |
| 174. H. H. Lloyd. | 1182. G. H. Palmer. |
| 201. J. Parsons. | 1721. W. R. Lake. |
| 220. A. B. Brown. | |

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

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|--------------------------|---------------------|
| 1803. J. Bullough. | 1919. J. M. Croft. |
| 1796. E. H. Waldenström. | 1942. W. E. Newton. |
| 1865. J. Thornton. | 1944. W. Barton. |

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

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|----------------------|-----------------------------|
| 1757. W. B. Adams. | 1778. A. J., and J. Topham. |
| 1749. J. C. B. Salt. | |